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Pitfalls in the diagnosis of paediatric tumours

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Abstract

The most important factor in terms of differential diagnosis of a new mass lesion in children is the child's age. In infancy, for example, congenital masses and many benign tumours are relatively common. As children grow older, the likely tumours vary with time. Some tumours, such as rhabdomyosarcomas, occur throughout childhood but most malignancies have relatively specific ages when their frequency is greatest. Those masses that manifest as a lump anywhere in the body, including the skull, should be evaluated first with ultrasound. Although benign lesions are often soft to palpation and malignant lesions firm, this is an unreliable clinical sign. Many lymphatic malformations come to attention as a result of an intra-lesional bleed which makes the mass tense and firm initially. Ultrasound can identify the cystic or solid nature of a mass lesion with relative ease. Vascularity can also be easily assessed, an important factor in evaluating proliferating haemangiomas, which manifest typically as fast-growing lumps in the first year of life. More complex mass lesions, or lesions with a deep extension, merit further cross-sectional imaging ideally with magnetic resonance (MR) imaging. If computed tomography (CT) is used, then only post contrast enhanced images are necessary as non-contrast images are usually uninterpretable (because of a lack of retroperitoneal or mediastinal fat in the abdomen and chest, respectively). Post contrast enhanced MR images are useful too in general, because enhanced sequences are necessary to fully evaluate lymphatic and vascular malformations, both of which can mimic malignant solid masses. Most solid tumours ultimately need biopsy confirmation, which is usually possible under ultrasound guidance. All tumours, with the exception of neuroblastoma, require chest CT for staging purposes. Sarcomas currently are also staged with radionuclide bone scans although there is a trend towards using more positron emission tomography (PET)/CT in patients with sarcomatous tumours. Neuroblastoma is staged via a combination of a *meta*-iodo-benzyl-guanidine scan plus bone marrow aspirates and trephine biopsies. Some imaging pitfalls such as foot vein contrast medium injection mimicking inferior vena cava thrombus, false-positive bone scans after bone biopsy, heavily calcified lesions mitigating against adequate ultrasound evaluation, and other examples will be illustrated via individual case presentations.

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